

*The*

# HEMIST

*March, 1961*



Emerson Venable, F.A.I.C., Chairman  
of the Pittsburgh AIC Chapter.

(See page 87)

Volume XXXVIII

Number 3



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Deadlines for THE CHEMIST: For the April issue the deadline is Mar. 15.  
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## IN THIS ISSUE

<b>Editorial:</b>	
The Key to Valuable Information	77
<b>Special AIC Announcements</b>	<b>78</b>
AIC Social Hour in St. Louis	
Officers Elected by Virginia Chapter	
New Chairman for Niagara Chapter	
Petition Approved for Golden Gate Chapter	
New Jersey Chapter to Honor Dr. Eby	
To All Chapter Chairmen	
To All Committee Chairmen	
Committee Breakfast Scheduled	
Connecticut Chapter Holds Organization Meeting	
Nominations for President-elect and Councilors	
<b>The White House Conference on Aging—a Report,</b>	
<i>Bernard E. Schaar, Hon. AIC</i>	83
<b>Life With Chemistry, Dr. K. S. Konigsbacher, F.A.I.C.</b>	85
<b>About AIC Members</b>	<b>86</b>
<b>Consulting Costs, Emerson Venable, F.A.I.C.</b>	87
<b>Professional Appointments</b>	<b>89</b>
<b>The Public's Responsibility to Scientists,</b>	
<i>E. R. Braithwaite, Ph.D., F.R.I.C.</i>	91
<b>Management Should Encourage Professional Societies</b>	93
<b>Opportunities</b>	94
<b>"Happy is the Miller . . ."</b>	95
<b>Sea Cities</b>	97
<b>Communications:</b>	
"A Chemist is a Curious Man"	101
The Incentive to Produce	101
Summer Jobs for Science Students Wanted	103
Membership Certificate	103
A Strong Protest	103
A Chemist Who Can Play the Violin	104
Comment on Cover	105
<b>Philippines to Establish Copper Industry</b>	105
<b>New AIC Members</b>	<b>106</b>
<b>To Come in April</b>	
The complete 38th Annual Meeting Program . . . "Why All Industry is Gradually Becoming Chemical Industry," by Dr. George D. Palmer, F.A.I.C. . . . The Philadelphia Honor Scroll Acceptance Address of Dr. C. C. Price, F.A.I.C. . . . The responsibility of industrial management to research personnel, excerpted from the Perkin Medal Address of Dr. Carl F. Prutton . . . "Who's Where," by Martin B. Williams, F.A.I.C., a report on the geographical area covered by AIC Chapters . . .	
<b>Advertisers Render a Service to You</b>	
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The Lento Press	100
Arthur D. Little, Inc.	94
Merck & Co., Inc.	73
Nopco Chemical Co.	96
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Foster D. Snell, Inc.	105
Truesdail Labs., Inc.	82

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## The Key to Valuable Information

**The Washington Annual Meeting**  
**May 11-12, 1961, Statler-Hilton Hotel**  
**Washington, D.C.**

**A**N enormous amount of scientific information is available in Washington, D.C., though many scientists are unaware of the best ways to obtain it. Dr. Clem O. Miller, F.A.I.C., general chairman of our 38th Annual AIC Meeting, for which the Washington AIC Chapter is our host, assures us that the three professional sessions on this subject, scheduled for the meeting, will be a greatly rewarding experience.

The first and second sessions on Thursday, May 11, have as their theme:

### **Washington the Information Center of the Nation**

At the morning session, speakers include:

**Dr. Burton W. Atkinson**, director, Office of Scientific Information Services, National Science Foundation-NRC.

**Mr. John Green**, director, Office of Technical Services, Department of Commerce.

A spokesman from the chemical industry, on "The Technical Information Dissemination Program of the Federal Agencies," as he sees them.

Dr. Miller says, while it might at first appear that this program is designed for information and documentation specialists, it is in reality designed for scientists who are confident that there is valuable information in Washington which they need, but which they do not know how to go about obtaining. This program will be illustrative of the methods which can be used in obtaining such information. Informative exhibits will also be on display by the Office of Scientific Information Services and the Office of Technical Services.

The subject of the Thursday afternoon session will be:

### **The U. S. Patent Office as an Information Center**

The information activities of the Patent Office are less well known than its role in issuing patents; in fact, this is a relatively new and rapidly developing function of the Patent Office. The entire afternoon will be devoted to presentations by representatives of the Patent Office and to a tour of the Patent Office, where its use as an information center will be demonstrated. There will be a question and answer period.

The third professional session on Friday morning will consider:

### **Steps Being Taken in Washington to Improve the Quality and Supply of Chemists, and Chemists and Science in Government**

The AIC Gold Medal for 1961 will be presented to Dr. Alden Emery, executive secretary of the American Chemical Society, at a banquet to be held Thursday evening, May 10.

(The complete program will appear in the April *Chemist*)

## Special AIC Announcements

### AIC Social Hour in St. Louis

A Social Hour for AIC members and their friends is scheduled to be held Monday, March 27, during the Spring meeting of the American Chemical Society in St. Louis, Missouri. Place: Statler-Hilton Hotel. Time: 5:30 p.m.

### Officers Elected by Virginia Chapter

The new Virginia Chapter has elected the following officers:

*Chairman*, Dr. Lee S. Harrow, Philip Morris, Inc., P.O. Box 3D, Richmond, Va.

*Chairman-elect*: Dr. Preston H. Leake, Manager, Chemical Research, Albemarle Paper Co., Richmond 17, Va.

*Secretary*, Robert Anderson, 104 La-Salle Drive, Richmond, Va.

*Treasurer*, William J. Nessley, 7204 Vernon Road, Richmond 28, Va.

*Representative to National Council*, Dr. John W. Eldridge, 701 Locust Ave., Charlottesville, Va.

*Local Chapter Councilors*:

A. Irving Totten, Jr.

Dr. Eugene D. Crittenden

Dr. Walter H. Hartung

Dr. William R. Harlan

### New Chairman for Niagara Chapter

Dr. J. Frederic Walker, chairman of the Niagara Chapter, has been transferred by E. I. du Pont de Nemours & Co., from Niagara Falls to Wilmington, Delaware. Frederick L. Koethen, 2494 River Road, Niagara Falls, N. Y., chairman-elect of the Chapter, will complete Dr. Walker's term as chairman.

### Petition Approved for Golden Gate Chapter

The National Council, at its February 9 meeting, approved the petition of AIC members in the San Francisco area to establish a Golden Gate AIC Chapter, to include members in the State of California north of Parallel 36.

### New Jersey Chapter to Honor Dr. Eby

The Honor Scroll of the New Jersey Chapter will be presented, April 19, to Dr. Lawrence T. Eby, F.A.I.C., assistant manager, Market Development Division, Enjay Chemical Co., Elizabeth, N. J. The presentation will be made at a dinner meeting at the Military Park Hotel, Newark, N. J. Dr. Eby is cited for his long and continuing interest in the professional and technical problems of the chemist and chemical engineer.

### To All Chapter Chairmen

Annual Reports covering the activities of AIC Chapters for the fiscal year 1960-61, for presentation at the 38th Annual AIC Meeting, May 12, 1961, should be received by the AIC Secretary on April 1, 1961.

### To All Committee Chairmen

Annual Reports of Committee activities for 1960-61, for presentation at the 38th Annual AIC Meeting, May 12, 1961, should be received by the AIC Secretary on April 1, 1961.

## Committee Breakfast Scheduled

Dr. L. T. Eby, chairman of the AIC Committee on Membership, and Martin B. Williams, chairman of the Committee on New Chapters and Expansion, announce that there will be a joint meeting of these two committees at a breakfast to be held Thursday, May 11, 1961, during the 38th Annual AIC Meeting at the Hotel Statler, Washington, D.C. All AIC members who are interested are welcome to attend this breakfast.

## Connecticut Chapter Holds Organization Meeting

The newly organized Connecticut Chapter met February 9, with over thirty members present. Dr. Frank J. Steele, 50 East Putnam Ave., Greenwich, Conn., was elected chairman; Mrs. Maria B. Jacobson, 326 Four Brook Road, Stamford, Conn., was chosen as secretary. Dr. Kurt S. Konigsbacher, chairman-elect of the New York Chapter, was enlisted as consultant for the new Chapter. Committees were appointed to draw up the constitution and by-laws, to plan programs, and carry out other functions. The group plans to hold its next meeting in March.

## Nominations for President-elect and Councilors

Nomination ballots for president-elect and councilors will be mailed to AIC members early in March. The

names chosen by the membership will appear on the election ballot to be mailed out in April. The names which will appear on the nomination ballot have been selected by the Committee on Nominations. Here is some brief information about these nominees:

### For President-elect

**Dr. C. Harold Fisher**, director Southern Utilization Research & Development Div., A.R.S., U.S.D.A., New Orleans, La. (B.S. Roanoke College; M.S. and Ph.D. Univ. of Illinois). He has worked at Harvard, the U. S. Bureau of Mines (Pittsburgh), Eastern Regional Research Laboratory (director of SRRL since 1950). He was formerly chairman of the Philadelphia Section of the ACS. He has been active in professional societies. In 1959, he received the Herty Medal. He was Councilor-at-large of the AIC for three years.

**Dr. Sidney D. Kirkpatrick**, consulting editor, McGraw-Hill Book Co., Inc. (B.S. Univ. Illinois. Hon. degrees, Clarkson Inst. Tech., Polytechnic Institute of Brooklyn.) Joined McGraw-Hill in 1921. Has served on many government missions. Active in many societies; has contributed much to professional recognition of scientific persons. AIC Councilor-at-large 1956-1962.

**Dr. W. George Parks**, professor of chemistry and chairman of Department, Univ. of Rhode Island, Kingston, R. I. (A.B. chemistry, Univ. of Pa., M.A. and Ph.D. Columbia Univ.) Executive director, National Academy of Sciences-NRC, advisory board on QM research & Development since 1943. Director Gordon Research Conferences since 1947. Member, ACS, AIChE, AATCC, Fellow of AAAS and N. Y. Acad. of Sciences. Hon. AIC Member. Member of the Scientific Advisory Panel to the Secretary of the Army (Sub-panel on CBR). Recipient of the Outstanding Civilian Service Medal, U. S. Army.

**Dr. Foster Dee Snell**, president, Foster D. Snell, Inc., 29 W. 15th St., New York 11, N. Y. (B.S. Colgate Univ., M.S. and Ph.D. Columbia Univ. 1923).

Taught at Columbia and Pratt Institute until 1928, while starting his consulting business which now employs some 150 people in New York, N. Y., Bainbridge, N. Y., and Baltimore, Md. He received the Gold Medal of the Society of Chemical Industry at Manchester, England, 1949; The Honor Scroll of the New York AIC Chapter, 1952, and Honorary AIC Membership in 1959. He was president of the AIC from 1946-48, and is active in many other societies.

**Dr. J. Frederic Walker**, Member, Patents & Contracts Section, Electrochemicals Dept., E. I. du Pont de Nemours & Co., Wilmington, Del. (B.S., M.S., Ph.D., M.I.T.). Received the Jacob F. Schoellkopf Medal of the Western New York ACS Section (1957) for research on formaldehyde and authorship of the ACS Monograph, *Formaldehyde*. National Councilor for the North Jersey and Western New York ACS Sections; chairman of the Western New York Section (1943-4). Chairman-elect (1959-60) of the Niagara AIC Chapter and chairman from 1960 to Feb. 1961, when he moved to Wilmington. Member American Section, Society of Chemical Industry.

### For Councilors

**Dr. Lawrence T. Eby**, assistant manager, Market Development Div., Enjay Chemical Co., Elizabeth, N. J. Born May 3, 1916, South Bend, Ind. (B.S. in Ch.E. '38, M.S. '39, Ph.D. '41, Univ. of Notre Dame.) Research chemist, Esso Res. & Eng. Co. 1941-57. AIC activities: Publicity chairman Annual Meeting 1954; Membership chairman 1954-61; Chairman, N. J. Chapter 1958-9; National Council Representative 1959-60; Chairman Com. on Qualifications and Com. on Chapter Activities 1960-61; will receive Honor Scroll of N. J. Chapter in April. ACS: National Councilor 1955-60; Com. on Local Sect. Act. 1955-60, Assist. Sec. No. Jersey Sec. 1953-60; Secretary 1959; Membership Chairman No. Jersey Sect. 1950-2, Chairman Central Subsection 1953; Chairman-elect No. Jersey Sect. 1961.

**Dr. Raymond Ewell**, vice-chancellor for research, University of Buffalo, Buffalo, N. Y. (B.S. Univ. of Toledo; M.S. Purdue; M.A. George Washington Univ.,

Ph.D. Princeton, 1937.) Assistant Prof., Purdue; Senior Technical Aide, National Def. Res. Com.; senior chem. economist, Shell Chemical Corp.; manager, chem. res., Stanford Research Inst.; assistant director, National Science Foundation, and economic adviser, Government of India. Over 50 publications. Active in many societies.

**Dr. David M. Gans**, vice president-research, The Arco Co., Div. of American Marietta Co., Cleveland 27, Ohio. Born Russia, 1905, naturalized. (B.S., M.S., Ph.D. (1929), Univ. of Chicago.) Instr. phys. chem. Univ. Chicago 1929-36; res. chem. Interchemical Corp., N. Y. '36, sr. chemist, '36-'39, asst. dir. res., '39-45; tech. dir., Quaker Chem. Prods. Corp., Pa. '45-49; dir. res., Arco Div '49-59, v.p. 1959 to present. Formerly chairman, chairman-elect, and Cleveland Dist. director of Ohio AIC Chapter. National AIC council representative 1959-60. Member of many societies. Has served with AEC, Off. Sci. Res. & Dev. (1959).

**Dr. Henry B. Hass** was head of the Department of Chemistry of Purdue University before coming east to become manager of Research & Development of General Aniline & Film Corporation. He was president of Sugar Research Foundation for eight years and is now consultant in Summit, N. J. He was president of the AIC in 1957-58.

**Dr. Maurice J. Kelley**, director, Project Coordination Dept., Nopco Chemical Co., Harrison, N. J. Born Aug. 6, 1916, Danielson, Conn. (A.B. LaSalle College, 1936; M.S. Fordham Univ., 1940; Ph.D. Univ. of Pennsylvania, 1942). With Nopco since 1936, he holds 10 U. S. patents; has written professional articles; is active in technical and community societies. He joined the AIC in 1938; in charge of arrangements for many local and national meetings, chairman of the National Committees on *Manuals of Chapter Operations* and of *National Council Operations*; secretary-treasurer, New York Chapter (1948-50); Chapter chairman (1950-51); representative to National Council (1951-54); Chapter councilor (1959-62). He received the Honor Scroll of the New York Chapter in 1959.

## NOMINATIONS

**D. H. Killeffer**, P.O. Box 443, Clearwater, Fla. Chairman of Florida AIC Chapter. (B.S. Chem. Eng. Univ. North Carolina 1915). Chemist until 1920. Then editorial work with Haynes publications and with ACS (I & EC, ACS News Service, C&EN, etc.) and the old *Scientific American*; also a long period as "pen for hire," public relations. Author of articles from atomic weapons, through biographies, church history, sales literature, adventure stories, yarns by a grandfather—some 50 odd books, including *Genius of Industrial Research*, *Molybdenum Compounds* (with Arthur Linz), and *Two Ears of Corn—Two Blades of Grass* (translated into 8 languages). Received the first impression of the James T. Grady Award of the ACS for promotion of public understanding of chemistry and chemical engineering, 1957. Retired since 1958.

**Dr. Charles T. Lester**, dean, The Graduate School of Arts & Sciences, Emory University, Atlanta 22, Georgia. Born Covington, Ga., Nov. 10, 1911. (A.B., M.A., Emory Univ., Ph.D. Pa. State Univ. 1941). Research chemist American Cyanamid Co. 1941-42; Faculty member, Chem. Dept., Emory Univ. 1942-57; Chairman, Chem. Dept. 1954-57. Chairman Georgia ACS Section 1948; Chairman Piedmont AIC Chapter 1958-59. Dean Graduate School, Emory Univ. 1957. Married, two sons, 19 and 16. Co-author of 3 patents and 27 articles in *J. Am. Chem. Soc.* and *J. Org. Chem.*

**Dr. Orville Edward May**, vice president, The Coca-Cola Co., Box 1734, Atlanta 1, Georgia. Born New Albin, Iowa, Aug. 22, 1901. A.B. George Washington Univ. (1924), M.S. (1926), Ph.D. (chem.) (1929). Chemist, Bur. Chem. & Soils, U.S.D.A. 1923-26; director Regional Soverbean Indust. Products Lab., Urbana (1936-39); North Regional Research Lab., Bur. Agri. Chem. & Eng. (1939-42); research coordinator, Agric. Research Admin. (1942-44); chief Bur. Agr. & Indust. Chem. (1944-46); vice president, The Coca-Cola Co., 1946-present. Member: ACS, Oil Chem. Soc., Inst. Food Tech., Pub. Health Ass'n.

**Dr. Clem O. Miller**, executive secretary, Div. of Chem. & Chemical Technology, National Academy of Sciences-NRC, Washington 25, D.C. (A.B. Man-

chester College; Ph.D. Univ. Chicago). Formerly instructor, Univ. Chicago; assistant professor, Northwestern Univ. Medical School; vice president & scientific director, Lakeside Labs.; president and chairman Board of Directors, Kremers-Urban Co., Milwaukee. Since 1957, he has been with NAS-NRC. Member, ACS, AAAS, A.Ph.A., Cosmos Club, Chicago Chemists Club, Sigma Xi. Chairman of the Milwaukee Section ACS, 1956.

**Dr. Kenneth W. Newman**, director, corporate Product Planning, Nuclear Corporation of America, Burbank, Calif. Born 1918, Mt. Vernon, N. Y. (B.Ch.E. Cooper Union; Ph.D. Columbia Univ. 1948). Experience includes United Sterling Corp., New York, and Turco Products, Los Angeles. Active in professional affairs of ACS. Chairman-elect, So. Calif. Section ACS, 1960-61. Member of many technical societies. Chairman, Western AIC Chapter, 1954-55.

**Dr. Lloyd H. Reyerson**, professor of physical chemistry, University of Minnesota, has recently served as chairman of an *Ad Hoc Committee* of the AIC studying the problems involved in improving the professional status of chemists. He is an elected member of the Council Policy Committee of the ACS, and was administrative head of the School of Chemistry of the University of Minnesota from 1957 to 1954.

**Dr. Fritz Rosenthal**, chairman, Beaver Falls AIC Chapter (1960-61), Born July 4, 1911. Ph.D. Organic Chemistry, University of Bern, Switzerland (1935); General Electric Co., Plastics Dept., (1936). Present position, director, product development, Knowlton Brothers, Watertown, N. Y. Membership in ACS, Society of Chemical Industry, Sigma Xi, TAPPI.

**Dr. Rudolph Seiden**, vice president, Research & Control, Haver-Lockhart Laboratories (subsidiary of Cutter Labs., Berkeley, Calif.), Kansas City, Missouri. Born 1900, Langenwang, Austria. Came to U. S. in 1935. (Diplom-Ingenieur; Dr. techn., Technische Hochschule, Vienna, Austria.) Since 1938 with Haver-Glover Labs., now Haver-Lockhart Labs., (pharmaceuticals & biologicals for veterinary use). Author, collaborator, editor of professional books and articles; holder of patents. A department editor of THE

**CHEMIST.** Organized and was chairman (1958-59) of the Midwest AIC Chapter; chairman, Pharmaceutical Products Committee, Animal Health Institute; member AIC Committee on New Chapters & Expansion.

**Emerson Venable**, partner of Hedenburg and Venable, consulting chemists and engineers, 6111 Fifth Ave., Pittsburgh 32, Pa., is chairman of the Pittsburgh AIC Chapter. He was formerly director of research, Freedom-Valvoline Oil Co.; research engineer, Westinghouse Electric Corp.; research chemist, Mine Safety Appliances Co. Active in ACS and other technical societies. Secretary, Association of Consulting Chemists & Chemical Engineers, Inc.

**Dr. Carl J. Wessel**, born Pittsburgh, Pa. Canisius College, Buffalo, N. Y. (B.S., 1934), Univ. of Detroit (M.S., 1938), Catholic Univ. of America, Washington, D.C. (Ph.D., 1941). Taught chemistry at University of Detroit and Wayne Univ., Detroit; associated as chemist with Pratt & Lambert Co., Buffalo, and R. P. Scherer, Inc., Detroit; associated since 1946 with National Academy of Sciences, Washington, D.C., where, since 1955, has been director of Prevention of Deterioration Center; has been a contributor to *THE CHEMIST*; president of the Washington AIC Chapter, 1957-59; chairman, Publicity Committee, 38th Annual AIC Meeting 1961.

**Martin B. Williams**, chemist (Rocket Fuels Research), Army Rocket & Guided Missile Agency, Redstone Arsenal, Ala. (Univ. of Alabama, B.S., M.S.) Experience in kraft paper, college teaching, foreign trade, dyestuffs & intermediates, forensic chemistry, ceramics and solid propellants. Member, Delta Chi, Gamma Sigma Epsilon, Tau Kappa Alpha, ACS, SASI, ARS, AOA, The Chemists' Club, (N. Y.), The Engineers' Club (Birmingham, Ala.) Contrib. ed. *THE CHEMIST* since 1954. Secretary Alabama AIC Chapter (1957-9) and chairman, (1959-60), National AIC Councilor from Alabama Chapter (1960-61); chairman, AIC Committee on Chapter Activities (1958-59) and chairman Com. on New Chapters & Expansion (1959-61), which were instrumental in increasing number of AIC Chapters from 13 to 28.

An international symposium on chemical reactions in the lower and upper atmosphere will be held April 18-20, 1961, at the Hotel Mark Hopkins, San Francisco, Calif. For information: Dr. Richard D. Cadle, Stanford Research Institute, Menlo Park, Calif.

The Technical Association of the Pulp & Paper Industry, 360 Lexington Ave., New York 17, N. Y., announces that a repeat course on evolutionary operation will be given March 17-18, 1961, at the Dinkler-Plaza Hotel, Atlanta, Georgia.

The 11th National Chemical Exposition, sponsored by the Chicago Section, American Chemical Society, will be held at the International Amphitheatre, Chicago, Ill., Sept. 5-8, 1961.

The Society of Photographic Scientists and Engineers will meet at the Arlington Hotel, Binghamton, N. Y., May 22-26. A review of progress in color photography is to be featured.

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## The White House Conference on Aging

Bernard E. Schaar, Hon. AIC

1631 Lunt Ave., Chicago 26, Illinois

(The author was a delegate from the State of Illinois to this Conference.)

ON September 2, 1958, Congress passed the "White House Conference on Aging Bill," which provided for participation in the Conference by delegates from every state. While sponsorship was to be by the Federal Government, the law states that "the primary responsibility is that of the States and Communities."

A National Advisory Committee of 150 individuals representing every state was appointed by Secretary Flemming of the Department of Health, Education and Welfare in June, 1959, to plan the Conference. During 1960, the States held local, regional and state meetings to formulate their recommendations to be considered at the Conference. It was estimated that at least 100,000 persons participated in those meetings, although only 2800 were designated as delegates to the Conference, which was held in Washington, D.C., January 9-12, 1961.

This Conference was organized under 20 sections, subdivided into about 70 work groups, each dealing with a particular phase of the Section's subject matter. Section topics were: Population Trends and Social and Economic Implications; Income Maintenance; Impact of Inflation on Retired Citizens; Employment Security and Retirement; Health and Medical Care; Rehabilitation; Social Services; Family Life, Family Relationships and Friends; Housing; Education; Role and Training of Professional Personnel; Free Time Activities; Religion; Biological Research in Gerontology; Medical Research in Gerontology; Psychological and Social Science Research in Gerontology; Social Community Organization; State Organization; National Voluntary Services and Service Organizations; Federal Organizations and Programs.

The Conference provided a forum where the States could ascertain practices other than their own on problems of the aging. Approaches toward better methods of performance were recommended by all sections. A major concern of all delegates was the method of financing medical care with responsibility for recommendation assigned to the section on Income Maintenance. At two final general sessions the Section recommendations were read. There was no voting at these sessions. However, tremendous applause greeted the recommendation of the Income Maintenance Section that the "basic means of financing medical care for the aged" should be through

the Social Security system, leaving no doubt that that represented the overwhelming conviction of the Conference.

Statements in the reports of most sections stressed the great shortage of trained personnel; the need for increased facilities, and the need for more research to deal properly with the problems raised by the mounting numbers of aged in the general population. At present there are 50-million past middle age with 16-million who are 65 years old or older.

In the Rehabilitation Section it was shown that many aged were unable to participate in the normal life of their communities because of illness, disabilities of one sort or another, or inability to do the kind of physical work which they performed prior to retirement. Many of these have been rehabilitated so as not to be dependent upon others. However, the majority of the aged who might benefit by such services are unable to get it because facilities, personnel and funds are not available. On the other hand, it was recognized that many over 65 are physically well and industrially competent. There was considerable questioning of the arbitrary setting of 65 years as the retirement age so generally accepted by management in industry. Housing is another area which is woefully lacking in facilities for the aged. Expansion of Federal mortgage insurance to permit construction of low cost housing especially designed for occupancy by the aged, was recommended by the Section on Housing.

In research, it was recommended that a National Institute of Gerontology be organized as a division of the National Institutes of Health. One Section recommended that the present \$4800 base in Social Security be increased periodically, so as to keep it in line with the rising wage level, and that benefits be adjusted from time to time so that purchasing power can be held nearly constant.

It was recognized by many Sections that the States alone cannot provide all means for taking care of the problems of their aged. Therefore it was suggested that a Federal Coordinating Agency be established to tie together all Federal agencies concerned with the aged, and to formulate, guide and coordinate, where possible, the individual efforts of the States. Permanent councils in each state to deal with the aged were recommended. Local communities likewise were advised to create committees on aging.

The Conference was not designed to take definite action on the care of the aged but rather to provide the States with bases from which to improve and expand their institutions and practices. Thus the Conference was only the start toward the formulation of programs by the Federal and State Governments, private organizations, and communities, so that the

THE WHITE HOUSE CONFERENCE . . .

needs of our senior citizens are better provided for. Life beyond 65 is the expectation today but many have not had the training to adapt themselves to the changes necessitated by that fact.

It was gratifying to see the thoughtfulness and consideration exhibited by the States and sections in arriving at their recommendations. It was especially so, in that all of it was done with the single objective of making it possible for senior citizens to live happier, more contented lives, with greater dignity as functioning members of their communities on levels commensurate with their capacities. With that end in view, the watchword of the Conference, "Aging with a Future—Every Citizen's Concern," has real meaning and content.

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## Life With Chemistry

Dr. Kurt S. Konigsbacher, F.A.I.C.

### *The Birth of a New AIC Chapter*

IT is an exciting thing to watch a new AMERICAN INSTITUTE OF CHEMISTS' Chapter being born. First there is nothing but an embryo secure within the national organization, and alive only because it is being fed by an outside source. The new chapter gradually begins to breathe, and then takes a few faltering steps hesitantly and unenthusiastically.

Finally, the newborn chapter begins to flex its muscles, interest quickens, and the chapter starts to function as a unit. It is baptized with the charter being approved by the membership and interim officers being elected; a committee is formed to take care of the Constitution and By-Laws; a program is established—in other words, the chapter is now actually on its feet.

If you were not present, you missed a really exciting event on February 9th when the Connecticut Chapter was baptized in Stamford. Much remains yet to be done, but the objectivities have been defined:

First: To inform the general public of the value of the research and industrial chemist in the Stamford area.

Second: To improve the professional standards of the chemist.

Third: To help the young chemist to get ahead in the profession of chemistry and chemical engineering, by informing the general public and management.

Let me close by congratulating the Connecticut Chapter and wishing it a happy and prosperous growth!

## About AIC Members



L. to R.: **Dr. Charles E. Feazel**, F.A.I.C., of Southern Research Institute, Birmingham, chairman, Alabama ACS Section; **Martin B. Williams**, F.A.I.C., of ARGMA, Redstone Arsenal, AIC national Council representative and chairman, AIC Committee on New Chapters and Expansion; **Prof. Emeleus**, holding vacuum reaction tube; **Oscar L. Hurt, Jr.**, F.A.I.C., of the Connors Works of H. K. Porter Co., Birmingham, chairman of the Alabama Chapter, and **Dr. Charles B. Colburn** of Rohm & Haas Co., Huntsville, chairman of the North Alabama ACS Section.

### Emeleus Speaks at ACS-AIC Meeting

The North Alabama Section of the American Chemical Society and the Alabama AIC Chapter, at their first joint meeting in Huntsville, Ala., had as speaker the internationally known inorganic chemist, Prof. Harry J. Emeleus of Cambridge University. Prof. Emeleus, president (1959-60) of The Chemical Society (London) and Fellow of The Royal Society, spoke on the "Chemistry of Inorganic Fluoralkyls" at the dinner meeting held Jan. 31, at the Holiday Inn Motel.

Officers of the North Alabama Section who were present, but not in the picture above, were Dr. John Lomartire of The Chemstrand Corp.,

Decatur, chairman-elect; Dr. Thomas A. Neely, F.A.I.C., of Thiokol Chemical Corp., Huntsville, secretary; and Wilbur A. Riehl, F.A.I.C., of the National Aeronautics and Space Agency, Huntsville, treasurer.

Because of favorable response to this first joint meeting, which attracted a record attendance, plans are to make an ACS-AIC joint meeting an annual affair for Huntsville. This was not the first cooperative venture, as a series of lectures in Polymer Chemistry by Dr. George B. Butler, F.A.I.C., professor of organic chemistry, University of Florida, was given under joint sponsorship of the ACS and AIC at Redstone Arsenal last summer.

(Also see pp. 92, 96, 100 and 106-8)

## Consulting Costs

Emerson Venable, F.A.I.C.

611 Fifth Ave., Pittsburgh 32, Pa.

(Excerpts from a paper, "Independent Research Consultants and Research for Small Business," presented at the Smaller Manufacturers' Council R & D Seminar, Pittsburgh, Pa., Nov. 17, 1960.)

**W**HAT services do independent consultants offer to "Smaller Manufacturers?" What is the present relation of independent consultants to small business in general? One might assume that organizations too small to sustain separate research departments would be the primary users of independent consultants and their laboratories. This is not the case. Most of an independent consultant's time is taken by large organizations with extensive research facilities of their own, who know from long experience the value of research. All but one or two consultants' organizations would be classified by the Smaller Manufacturer's Council as small businesses. We would like to work with smaller manufacturers, but we have found that they are difficult and expensive to sell, hard to keep sold, and that the chances of successful research is less than with large firms experienced in research . . .

Research involves a crystallization of goals and movement to attain them. A moderate and steady rate of movement is more likely to reach the goal and is certain to cost less than rush crash programs. Crash programs are expensive and often disappointing. Unfortunately the independent consultant is more often called in by small business to design and rush a crash program to get out of difficulties, which a modest research and development program would have avoided, then he is to set up such a positive research program.

Frank Howard's summary of the *Future of Industrial Research* by Thomas Midgley, Jr., made in 1944, is still timely although the fruits of research could not be predicted in advance. Cooperative research by small business has been very successful. The principal difficulty predicted by Stevenson, shortage of research manpower, has unfortunately proven true. The expansion of research by large industry, government, and university has made research a commodity in a seller's market, which brings us directly to the problem of research costs or rather rates. This is a field which often frightens off the smaller manufacturer.

Many of the causes of this frightening picture are discussed by Dr. Lauren Hitchcock in his article, "The Coming Crisis in Technology." Basically, research rates can be boiled down to relatively simple terms. *Chemical & Engineering News* headlined, Oct. 31, 1960, that 1960 start-

ing rates for scientists rose 7% over 1959. The current rate for beginning workers with the B.S. degree is between \$490 to \$525 per month. Research overhead runs about 100% over salary, so you can hire a full time beginner for about \$12,000 per year or a starting Ph.D. for \$18,000 per year. For the experienced research men you can expect somewhat higher rates, 20 to 30 thousand dollars being a reasonable cost. For implant work we must add about \$25,000 capital investment for laboratory facilities.

Many research institutes will sell you the services of a single researcher for rates comparable to these on a yearly basis. The independent consultant usually will provide research assistance to suit the character and needs of the program on less than a yearly basis. Most of our own work is done on a retainer and *per diem* charge with no formal contract and subject to cancellation by the client at any time.

Rates are only one facet of research costs. In plant research, costs often contain hidden elements which are much more expensive than proper laboratory research. Large scale experimentation on production is particularly dangerous.

I have spoken rather negatively on small business research, but I will give a case history which puts the lie to most of what I have said and shows the other side of the coin. One small business has maintained one research scientist over the past 40 years at an average of about \$12,000 per year. The royalties from his inventions alone have earned the company over \$900,000 so far and will continue for a number of years more even if the program be dropped. In addition his company has made substantial direct profits on their own manufacture and sale of his inventions. There are countless opportunities today of equal promise. Disraeli said, "The secret of success is constancy of purpose," and nothing is truer of research.

I have a number of pamphlets which will be useful in considering R & D programs for small business. The first is on "Quality Control & Research," by the Scientific Apparatus Makers Association. It is designed to encourage small businesses to set up a modest quality control laboratory. It is gospel truth except that the salary rates should be brought up to 1961. An independent consultant could help plan needs and recruit competent assistants.

*The Future of Industrial Research* by Thomas Midgley, Jr., should be in the hands of every management man concerned with R & D, and with it should be its companion summary by Frank Howard.

Last, I offer the directory of the Association of Consulting Chemists & Chemical Engineers, knowing that among its members are experts in all

## CONSULTING COSTS

phases and fields of modern research, men of attainment and principle, bound to a professional Code of Ethics, dedicated to science in the service of humanity.

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The Coming Crisis in Technology, Dr. Lauren Hitchcock. *Chemical Week*, Dec. 13, 1958, p. 95-104.

What the R/D Budget Covers, Van Zandt Williams. *Research/Development*, Nov. 1960, p. 14-24.

Consultants—Their Value to You, Dr. Paul Bachman. *Proceedings of the ACC & CE, Inc.* Oct. 27, 1959.

Consulting Services, 17th Edition, ACC & CE, 50 East 41st St., New York 17, N. Y.

### Professional Appointments

**Mar. 7, 1961. Atlanta, Georgia.** The Athletic Club. Meeting of Piedmont AIC Chapter. Speaker, Dr. Milton Harris, AIC president. For information: Prof. W. I. Wynn, Secretary of the Chapter, Emory University, Atlanta, Ga.

**Mar. 7, 1961. New Jersey.** Meeting of New Jersey Chapter. Subject, "Qualifications of High School Science Teachers in New Jersey." For information, Dr. Ralph M. Hill, New Jersey Chapter Secretary, 24 Bayberry Lane, Mountaintop, N. J.

**Mar. 8, 1961. Chicago, Ill.** Builders Club. Joint meeting of Chicago Chapter with AIChE. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

**Mar. 8, 1961. Birmingham, Ala.** Meeting of Alabama Chapter. Speaker Dr. Milton Harris, AIC president. For information: Robert E. Lacey, Secretary of the Chapter, 141 Kenilworth Dr., Birmingham, Ala.

**Mar. 9, 1961. New Orleans, La.** Meeting of Louisiana Chapter. Speaker, Dr. Milton Harris, AIC president. For information: Lawrence E. Brown, secretary of the Chapter, Southern Utiliza-

tion Research & Development Division, USDA, New Orleans 15, La.

**Mar. 9, 1961. Pittsburgh, Pa.** Webster Hall Hotel, The Hunt Room. Dinner meeting of Pittsburgh Chapter. 6:30 p.m. Speaker, Dr. Edward M. Arnett, Prof. of Org. Chem., University of Pittsburgh. Subject: "Reality in Science and Religion." Reservations: Dr. Robert W. Freedman, Consolidation Coal Co., Library, Pa. TEnnyson 5-4400, Ext. 3.

**Mar. 14, 1961. Minneapolis, Minn.** (Place to be announced) Joint meeting of Twin City Chapter with Minnesota Section ACS, Twin City Section of AIChE, and the Minnesota Industrial Chemists Forum. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

**Mar. 30, 1961. Los Angeles, Calif.** Los Angeles Athletic Club, 431 W. 7th Street. Meeting of Western Chapter. Speaker: Dr. Willard Libby, Nobel laureate. Subject, "Our Atomic Future." For information: Stuart R. Garnett, chairman of the Chapter, Blue Diamond Co., 1650 S. Alameda St., Los Angeles 54, Calif.

**Mar. 30, 1961. Kansas City, Missouri.** Rockhurst College, Massman Hall. 7:30 p.m. Meeting of Midwest AIC Chapter. Election of officers. Speakers: Warren Williams, patent attorney; Earl

Johnson, vice chairman of the Chapter, and Dr. A. Ernest MacGee, chairman of Chapter. For information: Earl D. Johnson, 2409 W. 47th Terrace, Kansas City 3, Kansas.

**Mar. 27, 1961. St. Louis, Mo.** AIC Social Hour in connection with the National Meeting of the American Chemical Society. (See ACS Program.)

**Apr. 4, 1961. Niagara Falls, N. Y.** Meeting of Niagara Chapter. Place, subject and speaker to be announced. For information: Prof. Howard W. Post, Secretary of the Chapter, Chemistry Department, University of Buffalo, Buffalo 14, N. Y.

**Apr. 4, 1961. Niagara Falls, N. Y.** Red Coach Inn. Meeting of Niagara Chapter. Speaker: Dr. Raymond Ewell, Vice-Chancellor of the University of Buffalo and Consultant to the Government of India. Subject: "Development of the Fertilizer Industry in India and Southeast Asia." Dinner 6:30 p.m. For reservations: Dr. A. F. Shepard, Hooker Chemical Corp., Grand Island, N. Y. Telephone RR3-7511, Ext. 610.

**Apr. 6, 1961. Philadelphia, Pa.** Luncheon meeting of Philadelphia Chapter. For information: Dr. Ezra Bitcover, Secretary of the Chapter, c/o U. S. Department of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

**Apr. 13, 1961. Watertown, N. Y.** Hotel Woodruff. Social hour 6:30 p.m. Dinner 7:30 p.m. Meeting of Beaver Falls Chapter with TAPPI. Speaker, Dr. K. A. Arnold, T.D., St. Regis Paper Co., New York, N. Y. Subject: "The Planning of a Technical Center." For information: Carlton Force, Latex Fiber Industries, Beaver Falls, N. Y.

**Apr. 19, 1961. Chicago, Ill.** Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. E. J. Sparling of Roosevelt University. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

**Apr. 19, 1961. Newark, N. J.** Military Park Hotel. Dinner and Meeting of New Jersey Chapter. Presentation of the Honor Scroll of the Chapter to Dr. L. T. Eby, F.A.I.C., Assistant Manager, Market Development Div., Enjay Chemical Co., Elizabeth, N. J. For information: Dr. Ralph M. Hill, New Jersey Chapter Secretary, 24 Bayberry Lane, Mountainside, N. J.

**April 20, 1961. New York, N. Y.** Place to be announced. Meeting of New York Chapter. Presentation of Honorary AIC Membership to Dr. Lloyd Van Doren, retired AIC Secretary. Subject of discussion, "Chemical Patent Procedure."

**May 4, 1961. Paoli, Pa.** Paoli Inn. Student Honor Award Meeting of Philadelphia Chapter. Topic and Speaker to be announced. For information: Dr. Ezra H. Bitcover, Chapter Secretary, U. S. Dept. of Agriculture, Eastern Utilization Research Div., Philadelphia 18, Pa.

**May 10, 1961. Washington, D.C.** Statler Hotel. Dinner Meeting of the AIC National Council, Board of Directors, and 38th Annual Meeting Committees.

**May 11, 1961. Washington, D.C.** Statler Hotel. Breakfast meeting of the Committees on Membership and on New Chapters and Expansion. Others interested are welcome. For information: Dr. L. T. Eby, 1105 DeWitt Terrace, Linden, N. J., or Martin B. Williams, 1013 Pratt Ave., N.E., Huntsville, Ala.

**May 11-12, 1961. Washington, D.C.** Statler Hotel, 38th Annual AIC Meeting. The Washington Chapter will be our host. See page \_\_\_\_.

**May 12, 1961. Washington, D.C.** Statler Hotel. Annual AIC Business Meeting 2:00 p.m. Reports of Officers, Chapters, Committees. Old and New Business. Announcement of Election of Officers.

**May 12, 1961. Minneapolis, Minn.** (Place to be announced) Meeting of Twin City Chapter. Presentation of student medals. For information: Dr. H. L. Weisbecker, 2138 Berkeley Ave., St. Paul, Minn.

**May 17, 1961. Chicago, Ill.** Beaubien Room. Meeting of Chicago Chapter. Speaker, Dr. Gerald Gordon, E. I. duPont de Nemours & Co. For information: Chicago Chapter Secretary, Miss Helen Selin, 6916 N. Wayne Ave., Chicago 26, Ill.

**May 25, 1961. New York, N. Y.** Place to be announced. Presentation of the Honor Scroll of the New York Chapter. Honoree and details to be announced.

# The Public's Responsibility to Scientists (and vice versa)

E. R. Braithwaite, M.Sc., Ph.D., F.Ph.S., F.R.I.C.

"Braystones," Bigbury-on-Sea, South Devon, England

(The author writes, "It may seem strange that a British physical chemist should attempt to discuss a local American problem, but this is really a 20th Century international sociological problem . . .")

THE only responsibility that the public has to the scientist, apart from ensuring his rights as a free man, is to make sure that he has freedom of thought. The public is responsible only for the use of the scientist's results and in this connection it can exercise as much control as it pleases on the technologist.

Whilst therefore, the public has no more responsibility towards a scientist than to any other member of the community, the scientist, like the preacher, has a greater responsibility to the public than have many other people. Science, like religion, is an approach to ultimate Truth—*What is the purpose of life?* and the presentation of its findings is a great social and moral responsibility.

The more science advances, the nearer to, or further from, religion it will become, and the ultimate clash or complete union will be the greatest even since the birth of Christ. This event will occur when we have reached the half-way stage and can answer the question, *What is Life?* We have to be ready for the answer to this question, for beyond this stage we must proceed alone or united with religion, towards the final solution of the problem, towards Truth itself. When this epoch is reached, we must make certain that there is not a clash of ideologies such as we currently witness in the political arena. This epoch should mark a "changing over" and not a break in the natural evolution of our mental outlook.

The two biggest obstacles to scientific progress imposed by the public are:

(1) *The arms race.* Here the public has a responsibility to itself as a whole, to create an atmosphere which will abolish this appalling waste of scientific thinking and misdirection of scientific effort.

(2) *Industrial competition.* It is argued with justification that there is more fundamental scientific research going on in industry than in our universities. We should not be proud of this fact. There should be more technological research in industry, but the university is still the only place suited to pure scientific research. Since industrial concerns must continue to make a profit, it follows that the thinking of their scientific members must be to varying degrees "directed." We are told that competition is healthy in the industrial field. Is this really good for science when we consider the new significance acquired by phrases like "Classified Literature" or "Top Secret" in this century?

It has been said that "to lure young people into our profession, make it so attractive that they will stand in line begging to join us." \* This typifies the attitude to science which worries me. Technology can be made attractive, but science cannot. It is primeval, unchanging, a constant challenge which becomes the energy giving food of technology. Any alteration can only lead to an undernourished technology. No, Dr. Eisenschiml, there is no shortage of scientists—only a shortage of scientific understanding and directed useful effort.

In short, therefore, the solution to the problem which may one day exist is:

- (a) A code of living based on aesthetics, rather than physics, and ethics, rather than genetics.
- (b) A return to the pursuit of learning for its own sake.
- (c) A firm stand against any attempt to dramatize science, as seems to be the procedure with most things these days.
- (d) Remove the threat of war.
- (e) Treat scientists as ordinary people.
- (f) Don't encourage scientists to become politicians, for the very nature of their training will not allow them to become good diplomats.

\* Eisenschiml, *The Chemist*, p. 415, November 1960.

**Dr. Arthur C. Cope**, F.A.I.C., president of the American Chemical Society, announces a new \$2000 chemistry prize, "The Peter Debye Award in Physical Chemistry," sponsored by Humble Oil & Refining Co. The award will be administered by the ACS.

**Roger Williams, Jr.**, F.A.I.C., former president, retains chairmanship of the board of directors, and Edward Tarnell has been named president, of Roger Williams Technical & Economic Services, Inc., of Princeton, New York, Toronto, London, and Geneva.

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## Management Should Encourage Professional Societies

*(Excerpts from an abstract of a talk given by J. J. Healy, Jr., president of The American Institute of Chemical Engineers, 25 W. 45th St., New York, N. Y., at the Midyear Conference of the Manufacturing Chemists' Association, Inc., in New York, N. Y., Nov. 22, 1960.)*

THE effective utilization of professional people is a matter of importance in these days of scarcity and high cost. At one time it was stated that a man just out of college was no good to a company unless he had been trained for two to three years. I doubt that this feeling still exists, but if it does, there must be something wrong with what we are teaching these people, or in the way that we are using them. It does seem that the principal part of the difficulty here might be lack of effective communication which spells out to the man (who may feel that he is doing a routine job not worthy of his skill) just what his segment of the job means to the whole program, and just what skill is demanded of him to carry it out effectively.

Where can management stand improvement? It can stand improvement in the matter of recognition of activity in professional society affairs. A man who of his own initiative becomes a member of the AIChE demonstrates a desire to improve his own professional knowledge and education, as well as to contribute to society through helping to improve the knowledge and professional attitude of other chemical engineers. This is to management's benefit, and we feel that more can be done to encourage it and to recognize it than is being done. In particular, it seems that there is a lack of public recognition on your part of people who become active in professional societies and who become officers of local sections or national bodies.

An inexpensive and probably rewarding form of recognition of the individual chemical engineer is attendance by you top people from time to time at local section meetings. Many of you are members, or are qualified to become members and, therefore, are distinctly privileged to attend these meetings. Regardless of membership, attendance even as a guest only once a year affords individual chemical engineers a chance to get together with you on an informal professional basis of equality, and they would certainly appreciate this opportunity. It offers you an opportunity, as well, to get acquainted with what the individual professional man is really thinking.

Many chemical engineers who join and participate in Institute activities, particularly committee activities, do so with the consent and aid of their companies, and they recognize this. On the other hand, they feel that

this consent is not really wholehearted and is treated as a somewhat necessary evil, rather than as something of benefit to the man and, therefore, to his company.

We recognize that this devotion to professional society affairs and attendance at professional society meetings must have some common sense limits. We recognize that some employers fear that men may use attendance at a national meeting as a means of looking for another job, or that they may be conversing too intimately with their competitors and disclose confidential information. Both of these are possibilities, but if a man is indoctrinated with a truly professional attitude and is treated as a professional, it seems to us that the risk of his carrying on such unprofessional practices is pretty low.

We feel that you will be well advised to give the professional status of the chemical engineer, as an individual, constant attention. We suggest that you encourage him to join the AIChE. We do not suggest that you make this compulsory or that you pay his dues. We suggest that you encourage him to attend meetings, particularly of his local sections, and that you back up this encouragement by appearing at these meetings yourselves once in awhile.

## Opportunities

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### Positions Available

**Manager, Pharmaceutical Research & Development.** Ph.D. in pharmacy or pharmaceutical chemistry, 5 to 10 years of pharmaceutical formulation experience. Ability to develop new ethical pharmaceutical products. Box 31, THE CHEMIST.

**Woman Chemist,** one year's experience in soaps, detergents or closely allied field. Typed resume required. Apply in person: Personnel Office, Hearst Magazines, 309 West 56th St., N. Y. 19, N. Y.

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## "Happy Is the Miller . . ."

**C**HEMISTS are noted for creating the new that makes the present obsolescent, but Ed H. Bucy, F.A.I.C., is a chemist who restored the old to make the present more flavorful.

He bought the 150-year old Kissingen Mills, equipped with old-fashioned buhr stones operated by a water wheel, at Kinsale, Virginia. There he grinds, by the old-style method, whole grain into rich flavored flours of wheat, rye, or buckwheat. He also makes white and golden corn-meals from whole corn kernels, and prepares special mixes such as those for Mississippi spoon bread, natural rice pancakes, and "hush puppies."

Flavor is the striking difference between these flours and those made by modern processes. The slow-turning buhr stones protect the natural nut-like flavor, because they do not heat up the grain while grinding it. The germ of the grain and the portions next to the hull are not removed, as in the usual present-day milling practices, and these parts, too, contribute to flavor.

The ancient, old-world art of stone milling was first practiced in Virginia in 1620, when skillful wrights were imported from England to construct water driven mills. By 1840 there were 3478 flour and grits mills there, but they gradually declined in number to the present few, as population increases necessitated more speedy milling technology. The patent on refined white flour, generally available by 1880, also turned the popular demand away from the darker flours.

Today, however, the full-flavored flours are returning to popularity among those who enjoy fine Colonial cooking. As our ancestors knew, there is scarcely a more heady or delicious taste than that of freshly-baked bread made from stone-ground, whole wheat flour.

Since Ed Bucy is a chemist, he has standardized all procedures, including grain purchases and the cleaning of the grain. He has also investigated the nutritional value of his products. For instance, in comparing cornmeal made by the old process with that made by the new, the energy calories and protein and carbohydrate percentages are similar. However, the whole grain meal contains approximately twice the amount of vitamins A, thiamin, riboflavin, niacin, and the trace elements of iron, phosphorus, and calcium, than does degermed cornmeal.

The product of the mills is largely marketed in the Baltimore-Washington-Richmond area. Some of the best-liked recipes are printed on the back of each bag of flour or meal. Mr. Bucy guarantees that "the flavor of

foods made from our cold stone-ground flours is exactly as it was 100 and more years ago." Just 100 years ago, a country squire in Pennsylvania wrote, "Buckwheat cakes and butter with good maple syrup is a little of the best eating yet!"

**Prof. Louis P. Hammett, F.A.I.C.**, of Columbia University, will receive the 1961 Willard Gibbs Medal of the Chicago Section of the American Chemical Society, May 19.

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**Prof. Herman F. Mark, F.A.I.C.**, director, Polymer Research Institute, Polytechnic Institute of Brooklyn, N. Y., is also a scientific consultant for Stanford Research Institute, Menlo Park, Calif.

**Emerson Venable, F.A.I.C.**, consultant, Pittsburgh, Pa., has been made a member of the Air Pollution Control Advisory Committee of the Allegheny County Health Department, Pittsburgh 19, Pa.

**William L. Abramowitz, F.A.I.C.**, chairman of the board, announces the appointment of John L. Rudge as president of Carlon Products Corp., Box 133, Aurora, Ohio. William W. Clark was appointed secretary.

**Arthur K. Doolittle, F.A.I.C.**, has been elected managing partner of Dorr Consultants, 99 Park Ave., New York, N. Y.

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## Sea Cities

(Major excerpts from an article by Hilbert Van Nydeck Schenck, Jr., associate professor of mechanical engineering, Clarkson College of Technology, Potsdam, N. Y., reprinted from the *Clarkson Letter*, Nov.-Dec. 1960, with permission.)

WITH many technologists and science writers somewhere off in space, we seem to forget that we are still a long way from either understanding or occupying our own planet. The earth has almost 14 times the surface of the moon and about four times the surface of Mars. All but about 29% of this surface is underwater, a vast unexplored realm populated by untold billions of odd creatures, many still undiscovered and uncatalogued by zoology. Much of this drowned land is almost inaccessible to present manned vehicles and can be visited for only the briefest of periods. In the depth range, zero to about 660 feet, where man can more or less easily penetrate, we find only 5.4% of the total surface area of the earth. This is still two-thirds of the surface area of our moon, and to reach that arid neighbor we are prepared to spend many billions in national treasure.

We have heard much of the benefits that will result from a station in space, but the benefits of a city (or more modestly, perhaps, a very small village) under the sea could be far greater to humanity as a whole. The commercial exploitation of oil and minerals in water too deep to work from the surface comes immediately to mind. Harvesting of weed and shell fish, archaeological studies, control of currents and waves, detection of seismic disturbances, and even subsurface tourist resorts have been proposed. From a research standpoint, a small undersea scientific community could offer the following projects to resident scientists; studies of ecology and biology "in situ," research on corrosion, salinity, sound propagation, light scattering and focusing by natural water, oceanic heat balances, core drilling for fossils, cosmic ray and natural radio-activity measurements, magnetic field study, water-wave study, shore-line sand-migration etc. Much of this "pure" research might have very immediate application in the work of feeding, clothing, controlling and understanding our world, its climate and its weather.

Any permanent community in the sea could take one of two basic forms, which I will classify as "open" and "closed" cities. The closed or "low pressure" city is no more than a stationary submarine, thickly ar-

moured against the pressure of the depths and, like a space ship, a tiny world that insulates its users from all contacts with the environment. The design of such cities would follow general rules of submarine engineering . . . More exciting and also more uncertain are the open or "high pressure" cities. In these, man would create an air-filled bubble at the bottom of the sea, thin-skinned and containing the full hydrostatic pressure of the surrounding sea water. This can become very great, since every 33 feet in depth increases the water pressure by one full atmosphere.

The advantages of the open city lie in the very intimate relationship between the men of the city and the surrounding sea. Our open city is no more than a gigantic diving bell and to leave it and visit the bottom a man need only "slip under the edge," equipped, of course, with some form of breathing apparatus. Ecological studies, and work involving drilling or mining would certainly profit from such convenience. Also, it appears that such a submerged community might be far cheaper to construct than closed types since large pressure-induced stresses need not be met. The buoyancy of the dwellings is the main structural problem and concrete moorings could probably be dropped in place to keep the air-filled containers from popping like monster corks to the surface.

Open sea cities are best classified by depth range, which in turn is dictated mainly by human physiology . . . Let us call our city in the depth range 0 to 36 feet, a shallow city. In such modest depths, the city should be constructed away from the more dangerous areas of storm and wave surge, probably in lagoons or bays. The "magic number," 36 feet, identifies the maximum depth from which man does not need to decompress, that is, rise in carefully graduated stages to allow the nitrogen dissolved in blood and tissues to escape without forming harmful bubbles. In other words, a person who spent long periods in a shallow city could swim immediately to the surface without fear of contracting the painful and deadly divers' malady, "the bends." It seems to me that the shallow city will be mainly useful as a tourist resort located in tropical areas.

The depth range for an intermediate depth city is 36 to about 120 feet. Within this range, long residence will demand careful return to the surface following a "decompression schedule" or, more likely, a treatment room will have to be included in the city itself. In this depth range, if the air breathed has normal composition, an obese person who spent several days or weeks in the city would need as long as an entire day to become fully decompressed, although several hours would serve for the majority of persons. Thus an intermediate city would be most efficient if the inhabi-

## SEA CITIES

tants worked, slept, and ate right in the city for at least a week at a time. In fact, it is this decompression problem that makes this deeper sea city so attractive. Since the inhabitants are not changing pressure environment when they go and come (as a surface diver always is) they can put in many hours of work a day in the water without discomfort and long decompression periods. A diver from the surface, for example, will require 128 minutes of careful ascent from 120 feet after working for 100 minutes at this depth. It is this single problem that makes prolonged undersea work both dangerous and prohibitively expensive.

Our deep city occupies the depth range 120 feet to about 600 feet, and providing for the respiration of persons in such cities calls for more exotic solutions. At depths in excess of 120 feet, pure air becomes less and less possible as a respirable mixture. In these greater depths, the nitrogen has a narcotic effect, not yet understood, called "nitrogen narcosis" or more popularly, the "rapture of the deep." The euphoric condition induced by high pressure nitrogen is so dangerous, that nitrogen must be replaced by some less narcotic gas at these great depths . . . It might seem reasonable to eliminate the nitrogen and use pure oxygen, but at pressures in excess of two atmospheres (about 29 psi) pure oxygen is even more deadly than nitrogen, rapidly producing convulsions and possibly pneumonia. Thus we must actually cut back on the oxygen pressure (we only need 3 psi anyway) and make up the difference with helium. Helium, for reasons unknown, does not seem to produce narcotic effects in the range 120 to 600 feet, although test dives to the deeper end of this range have been of short duration to date.

It is often suggested by popular writers that helium "air" permits reduction of decompression time, but this is not generally true and decompression from 400 to 500 feet might take several days, whatever the gas mixture. Thus medical facilities and a doctor would be essential "on the bottom." Helium has some disadvantages. Of not too great importance is the radical change in voice tone when one speaks in a helium rich atmosphere, the lighter gas giving all human speech a distinct "Donald Duck" quality. More serious is the very much greater cooling ability of helium in free and forced heat-transfer convection. This effect could produce great discomfort in a damp, chill room and can only be overcome by maintaining high city temperatures, wearing heavy clothing, and by having workers with healthy metabolisms. In the U. S. Navy "helium hat" diving rig, electric underwear is standard equipment to prevent chill.

Without doubt, helium does produce a narcotic effect at some deep,

and as yet undetermined, depth. At this point we should introduce our very deep open city, which is definitely a "blue sky" project. This would depend upon the discovery of an inert diluent for the oxygen. If gas molecular weight is crucial in the narcotic effect, hydrogen might be safe where helium is not. Hydrogen as a diving gas was tried in 1945 by a Swedish engineer, Arne Zetterstrom, but unfortunately he was killed by a cable snapping before his suit could be fully evaluated. The hydrogen-oxygen mixture is not as dangerous, explosion-wise, as might appear, since the oxygen percentage will be so small as to render the mixture non-inflammable. How deep could such a hydrogen-supplied city go? This is impossible to predict. The human body should be able to exist under many dozens of atmospheres of pressure since it is mainly fluid and therefore relatively incompressible. Probably the ultimate depth limit of an open city will be set by either the narcotic effect or by some now unknown pressure effect. At depths in excess of 600 feet the decompression time might be prohibitive . . .

A small, open sea city capable of supporting a scientific staff of perhaps ten persons would be a far less expensive undertaking than a space satellite and might promise much more . . . It is right to hope that such peaceful and fruitful enterprises may receive more attention from both government and private groups.

Chas. Pfizer & Co., Inc. announces that its foreign subsidiary, Pfizer Corporation, has acquired one-third interest in Laboratori Italiani di Ricerca Chimica S.p.A. of Milano, Italy.

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**Loren B. Sjostrom, F.A.I.C.**, was honored on the occasion of his 25th anniversary with Arthur D. Little, Inc., Cambridge, Mass., at a luncheon, Jan. 17. He was presented with a flying acorn service pin by President James M. Gavin and an anniversary watch by Raymond Stevens, Hon. AIC, chairman, Executive Committee.

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## Communications

### "A Chemist is a Curious Man"

To the Editor:

Answering Prof. Weaver's question in the February 1961 issue, p. 67:

In 1944, M. H. Arveson prepared a booklet, "The Chemist & Chemical Engineer in Industry," as a part of the educational program of the 3d National Chemical Exposition. Demand for the booklet for educational and vocational guidance was tremendous, and tens of thousands of copies, of several printings, were distributed free of charge by the Chicago Section of the American Chemical Society. In 1950 a complete revision was made under the title, "A Chemist is a Curious Man," and similar distribution made, starting with the National Chemical Exposition that year.

Both booklets have been out of print for many years. Requests for them are still being received, apparently because they continue to be listed in "Sources of Free Educational Materials" by persons who do not check on availability. Only this week we had an inquiry from an author who decided to make such a check for a second edition, after listing the book in a publication issued 3 years ago, at which time the supply had been gone for a couple of years.

Some libraries may have files of the *Chemical Bulletin* published by

the Chicago Section ACS. The Nov. 1944 and Sept. 1950 issues contain the complete text of these booklets.

—James J. Doheny, F.A.I.C.  
*Manager, National Chemical  
Exposition  
Chicago 1, Illinois*

### The Incentive to Produce

To the Editor:

I am sorry it is impossible to agree with my valued colleague, Dr. Makara. (*THE CHEMIST*, Jan. 1961, p. 24). His premise that the government has paid for the research is wrong, because the commercial patent rights are the part of the consideration paid that makes it possible for a small firm to take on government work at a nominal 6-7% profit, but a practical 0-2%, when industrial clients pay 15%.

If commercial firms in peacetime were obligated to do government work without profit, a large step would be taken toward a statism most of us seek to avoid.

However, actual trial is the best way to determine the practicality of a suggested procedure. The experiment of running government contracts without patent right clause has been made, and the result is before us, for all to see.

The National Institutes of Health have operated their program as Dr. Makara recommends. Let us then compare their record with that of the Armed Services, which do grant

patent rights, with the tangible returns to the government per dollar of research investment.

The principal task of the National Institutes of Health, broadly speaking, is to extend the healthy portion of human life. A chart (page 11, Jan. 1961 CHEMIST) of life expectancy at age 60, from 1789 to recent years, shows that insufficient progress has been made.

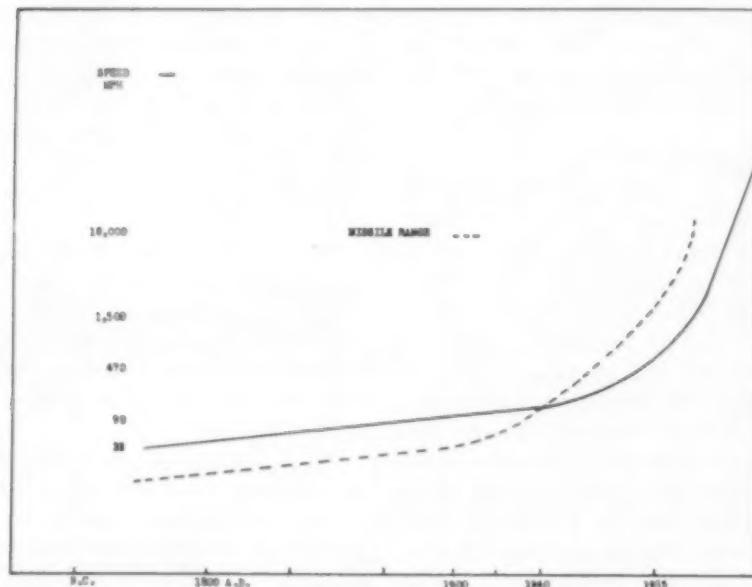
The slight increase in the last decade is mainly due to the advent of antibiotics, a development which has not been attributed to the Institutes of Health.

Compare with this the progress made in fields which have been the

prime responsibilities of military research—the speed attainable by man, and the distance that can be covered by a missile. These are shown in the following curves: (see chart below.)

Here, a very substantial share of the progress can be attributed to contractors working under military grants, and under patent incentives.

Nor are these isolated instances. A large family of sharply ascending progress curves can be drawn, to show progress in virtually all areas under concerted attack by military research, including as an integrated, effective part its large and small contractors from industry, independent laboratories, and academic institutions.



## COMMUNICATIONS

Such progress areas include, for example, progress in strength of alloys, in high temperature resistance of materials, in adhesion, in rigidity as function of weight, and others too numerous to list.

If we compare the list of contractors of the Armed Forces, (whose breadth of base and variety of background of approach has certainly contributed to the speed of progress) with the list of contractors of the National Institutes of Health, we are struck by the fact that the latter shows a lack of variety and a total absence of the small individual enterprises.

The test of relative merits of these systems has thus been made, and it appears to indicate that the system Dr. Makara advocates has been applied, and has not proven nearly as conducive to rapid progress as has the system recommended by the AIC Council.

—Dr. Johan A. Bjorksten, F.A.I.C.  
*Madison 1, Wisconsin*

### Summer Jobs for Science Students Wanted

To the Editor:

I would appreciate any help you may be able to give to our students in obtaining summer employment. I hope members of the New York AIC Chapter will take advantage of this opportunity to encourage some of our future scientists. Seniors and graduates of the Bronx High School of Science are seeking summer employ-

ment. Any leads for jobs should be forwarded to Mr. Hy Mencher, 1020 Boynton Ave., Bronx 72, N. Y.

—Hy Mencher, F.A.I.C.

### Membership Certificate

To the Secretary:

I acknowledge receipt of an exquisite certificate of membership, worthy of exhibition along with my diplomas and other certificates. But, most important is the feeling and the satisfaction of being a member of an institution which has as its primary purpose the advancement of the profession of chemistry.

—Dr. Joseph F. Saunders, F.A.I.C.  
*Washington 25, D.C.*

### A Strong Protest

To the Editor:

As a friend of orderly and conservative progress, I want to voice a strong protest against the article by S. S. Dowryman regarding Dr. Allen's enlightening article on reasons for refusal of grants from the National Institutes of Health (*THE CHEMIST*, Feb. 1961). Dr. Dowryman's "Translations" are unfair, unreasonable and iconoclastic. To go over each of the points would be giving this "translation," which I would rather term "transgression," more attention than it merits. Therefore, I shall only point to those three causes for refusal of grants which account for more than 30% each:

- (1) "The problem is of insufficient importance or is unlikely to produce any new or useful informa-

tion (33.1%)" is "translated" by Dr. Dowryman: "Nobody in the study group is interested in it."

This is a wholly unwarranted conclusion. There could have been one, and indeed several, of the members of the study section who would have been genuinely interested, but who did not have the time to read the proposal, or who were outvoted by the majority.

(8) "The proposed tests, or methods, or scientific procedures are unsuited to the stated objective (34.7%)" is translated by Dr. Dowryman: "I would never have thought of that. One of us must be slipping."

The inference appears wholly unsupported by the facts available. I would suggest that if anyone here is slipping, it is probably Dr. Dowryman:

(17) "The investigator does not have adequate experience or training or both for this research. (32.6%)" is translated, "He isn't one of my pupils. Why did he have to train in Chicago?"

The inference that training in Chicago is inadequate, even though limited to "this research" is outright libelous, and it is to be hoped that the several outstanding educational institutions in Chicago will jointly take Dr. Dowryman to task most severely in this matter.

Those examples suffice to show the nature of Dr. Dowryman's scurrilous opus which I submit should never have been published in THE CHEMIST.

The writer wishes to express his admiration for the efficacy of Dr.

Allen's criteria as applied by the NIH in screening out all of the projects which deviate from the norm of the accepted in one direction or the other. Of the more than 600 projects currently supported by the NIH, there is none which anyone could justly term ill considered, poorly planned, or in any way out of the ordinary. Likewise, there is no evidence of any of the "flashes of genius" which can engender breakthroughs from the norm, which are so upsetting and cause an imbalance in the accepted flow of orderly progress. These have also been screened out.

Truly, the criteria shown by Dr. Allen are admirable and commendable instruments for ensuring that progress in our health knowledge be orderly; as Kipling phrases it, "With the even step of an army where no man breaks from the line."

—S. B. Plodder  
Chicago, Ill.

### A Chemist Who Can Play the Violin

To the Editor:

We really have made astonishing advancement since the turn of the century. After the great pioneers, Dr. Whitney, founder of General Electric's famous "House of Magic," and Dr. Little of Boston had sold some of the hard-boiled Captains of Industry on the value of research, others had to follow suit. I recall that one disgruntled manufacturer wrote to

## COMMUNICATIONS

Prof. Talbot of M.I.T.: "We had to build a laboratory; now we've got to get a chemist. Please send us a chemist, preferably one who can play the violin!"

—Dr. G. A. Abbott, F.A.I.C.  
*Grand Forks, North Dakota*

**Note: Dave Young, F.A.I.C., chairman of the Chicago Chapter, was born too late!**

### Comment on Cover To the Editor:

The new cover is most attractive and decidedly an improvement.

—P. T. Pafford, M.A.I.C.  
*Chicago, Ill.*

### Philippines to Establish Copper Industry

The first integrated copper and zinc extracting and fabricating plant will be built in the Philippines within two years, it was jointly announced by the Foster Wheeler Corporation, prime contractor, and the E. W. Bliss Co., which will furnish the patented fabricating equipment needed for converting copper metal powder into high-quality strip. Chemetals Corporation of New York, N. Y., which licenses chemical reduction techniques owned by Sherritt Gordon Mines Limited of Toronto, Canada, is supplying the process for the chemical leaching of the copper from its ores and its gaseous reduction to pure copper powder.

Marinduque Iron Mines Agents, Inc., of Manila, chose the new chem-

ical-leaching process, instead of conventional smelting facilities, for its economy and efficiency in handling small tonnages; because the special type of copper-zinc-sulfur concentrates there are amenable to leaching, and because the ammonium sulfate by-product from the process is needed as fertilizer for sugar cane and rice growing.

The Export-Import Bank of Washington has authorized a \$12 million credit in favor of Marinduque, to acquire the U. S. machinery, equipment, materials and engineering services needed to put the plant in operation. The total cost of the project is estimated to be \$26 million.

The proposed plant, to be built at Iligan Bay, Mindinao Island, will be designed to treat 75,000 tons of copper concentrates to produce, annually, 14,000 tons of copper; 5000 tons of electrolytic zinc, and 98,000 tons of the by-product, ammonium sulfate.

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We cordially welcome the following new AIC members, elected at the Sept. 11, Dec. 7, 1960 and Feb. 9, 1961, meetings of the National Council:

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#### Barker, James E.

*Supervisor of Laboratory Equipment, Tennessee Corp., 1971 Roosevelt Highway, College Park, Ga.*

#### Barrington, Dr. Leonard F.

*Director of Applications Research, A. E. Staley Mfg. Co., Decatur, Ill.*

#### Barrow, William J.

*Self-employed. Restoration of documents, 30 Albemarle Ave., Richmond, Va.*

#### Bavley, Dr. Abraham

*Manager of Research Division, Philip Morris Research Center, Richmond, Va.*

#### Boger, George K., Jr.

*Manager, Engineering Economics, Fiber Products Research Center, Inc., Beaver Falls, N. Y.*

#### Bowman, Dr. Lewis W.

*Section Head, Esso Research & Engineering Co., P.O. Box 51, Linden, N. J.*

#### Bravo, Dr. Justo B.

*Research Group Leader, Basic Res. Div., Sun Oil Company Research & Engineering, Marcus Hook, Pa.*

#### Butler, Dr. George B.

*Professor of Chemistry, University of Florida, Gainesville, Fla.*

#### Collins, Dr. Galen F.

*23 Sunset Drive, Norwich, N. Y.*

#### Cruse, Robert R.

*Associate Industrial Chemist, Southwest Research Institute; Associate, Southwest Agricultural Institute, San Antonio, Texas.*

#### Cucullu, Mrs. Alva F.

*Chemist, Southern Utilization, Research & Development Division, USDA, Box 19687, New Orleans 19, La.*

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### Mangum, Grafton F.

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**Santaniello, Anthony F.**

*Supervisor, Urethane Sect., Thiokol Chemical Corp., 780 N. Clinton Ave., Trenton, N. J.*

**Saunders, Dr. Joseph F.**

*Assistant Head (Biochemist), Medicine & Dentistry Branch, Office of Naval Research, Washington 25, D.C.*

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*Data Analyst, Design Service, Western Electric Field Location, Patrick AFB, Fla.*

**Volpe, Nicholas**

*Eastern District Manager (Sales), Wm. Ainsworth & Sons, Inc., Denver, Colo.*

**Williams, Warren N.**

*Patent Attorney, Hovey, Schmidt, Johnson & Hovey, 1816 Federal Reserve Bank Bldg., Kansas City, Mo.*

**ASSOCIATES****Blackwelder, Frank G.**

*Quality Control, Coca-Cola Co., Atlanta 1, Ga.*

**D'lorio, Barbara I.**

*Research Chemist, Inorganic Polymer Group, Pennsalt Chemicals Corp., Whittemarsh Research Laboratories, Wyndmoor, Pa.*

**Grenja, Helen E.**

*Research Technician, Biochemistry Dept., Emory University, Emory University, Ga.*

**Harlowe, William W., Jr.**

*Assistant Chemist, Southwest Research Institute, San Antonio 6, Texas.*

**Joyce, John F.**

*Graduate Student, Physical Chemistry, University of Rochester, Rochester, N. Y.*

**Kelty, James T.**

*Instrument Specialist, Fisher Scientific Co., St. Louis 18, Mo.*

**Walker, Mary**

*Laboratory Technician, The Coca Cola Company, Atlanta 1, Ga.*

**REINSTATED AS FELLOWS****Clark, Dr. David M.**

*Director of Research Services, W. R. Grace & Co., Research Division, Clarksburg, Md.*

**Luckens, Mark M.**

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**Yarbrough, J. Preston**

*Chemist, Control & Development of New Products, Cremulsion Co., Atlanta, Ga.*

**RAISED FROM MEMBERS  
TO FELLOWS****Garnett, Stuart R.**

*Chemical Engineer, Blue Diamond Corp., 1650 South Almond St., Los Angeles 54, Calif.*

**Pinigin, Edwin J.**

*Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Pa.*

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